

## COMPARISON OF SAND NESTING WASPS (HYMENOPTERA) FROM TWO PINE BARRENS IN UPSTATE NEW YORK<sup>1</sup>

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**ABSTRACT:** Collections of sand inhabiting wasps from the Fort Drum Military Reservation and the Rome sand plains indicate a common fauna with pine inhabited sandy areas in the nearby Black River Valley and elsewhere in upstate New York. There were no pine barren indicator species in the collections.

Pine barrens are an imperiled ecosystem in the northeastern United States. In upstate New York, they comprise depauperate pine-oak woodlands growing on fire swept or otherwise disturbed sandy soils. The nutrient impoverished, water deficient, primarily acidic sandy soils supporting these woodlands historically were often anthropogenically altered. The sparse interrupted canopy is composed of white pine (*Pinus strobus* L.) and/or pitch pine (*P. rigida* Mill.) trees. A tall dense shrub layer dominated by scrub oak (*Quercus ilicifolia* Wangenh.) or, sometimes, stunted white oak (*Q. alba* L.) grows beneath these trees. A low shrub layer often composed of Ericaceae, forbs, and grasses grows beneath the oaks and in interspersed openings (Schweitzer and Rawinski 1988).

The species of sand nesting wasps that inhabit upstate New York pine barrens is poorly known. Two pine barrens areas devoid of wasp collection records are the Fort Drum Military Reservation in Jefferson County and the Rome sand plains in Oneida County (Fig. 1). Fort Drum is situated on a site known historically as the "pine plains." An abundance of white pine, some pitch pine and white oak, and many deciduous tree species grew there on level, dry, sandy soil in the 1790s. These pine plains were located on droughty sands and loamy fine sands north of the large bend in the Black River between the villages of Great Bend and Deferiet. More than 10,000 ha of moderately well to excessively drained sandy soils blanket this section of Fort Drum (USDA 1989).

The Rome sand plains contain approximately 1,200 ha of sandy soil. Half this acreage is moderately well to excessively drained and suitable for psammophilous wasp habitation (USDA 1997 pers. comm.). Although the Rome sand plains contained extensive pine barren acreage at the turn of the last century (Stephens [sic] and Barrus 1911), the predominant vegetation through most of the millenium was a mesophytic deciduous-coniferous forest (Russell 1996).

The purpose of this paper is to: (1) present the results of solitary wasp

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collections from these two localities; (2) relate these results to collection records for this group from other pine inhabited sandy localities in upstate New York; and, (3) determine whether or not pine barrens were part of the ancestral vegetation landscape based upon wasp species.

## METHODS

Eighteen trips were made to the Fort Drum Military Reservation during August 2-October 18, 1996 and April 3-October 4, 1997 for the purpose of collecting sand inhabiting wasps. Actual time spent collecting there totalled 70 hours. Collections were made on barren Plainfield sand.

Seven trips were made to the Rome sand plains on June 27, 1992, July 28, 1993, July 13, 1995, and June 2, July 26 and September 10 and 27, 1997 for this purpose. Actual time spent collecting at this locality totalled 35 hours. Collections were made on barren Windsor loamy fine sand.

## RESULTS

One-hundred and nine species of Tiphidae, Mutillidae, Scolidae, Pompilidae, and Sphecidae were collected at Fort Drum (Table 1). Twenty-two (20.2%) of these species were not sand nesters. Sixty-three species of Tiphidae, Scolidae, Pompilidae, and Sphecidae were collected at the Rome sand plains (Table 1). Only five (7.9%) of these species were not psammophilous. Sixty-two species of Tiphidae, Scolidae, Pompilidae, and Sphecidae were common to both localities. Forty-seven species of wasps found at Fort Drum were not collected at Rome. Only one species collected at Rome, *Tachytes validus* Cresson, was not found at Fort Drum.

*Stictiella emarginata* (Cresson), a species rarely found in upstate New York, provisioned nests at Fort Drum with adult moths of the family Noctuidae (pers. obs.). *Phlanthus albopilosus* Cresson collected at Fort Drum was at the eastern extremity of its range (Evans 1975).

## DISCUSSION

The species of sand inhabiting wasps from Fort Drum and the Rome sand plains were similar to those from the Black River Valley in adjacent Lewis and Herkimer Counties and other localities in upstate New York (Cayuga County: Auburn, Sennett; Oswego County: Granby Center, Mallory Station, Selkirk Shores State Park; St. Lawrence County: Parishville) (Kurczewski 1994; Kurczewski and Acciavatti 1990; pers. obs.).

The absence of *Tachysphex pechumani* Krombein, a characteristic faunal element in the New Jersey and lower Michigan pinelands, implies that the New York State pine barren sites were anthropogenically induced. The overwhelming dominance of pre-Euro-American settlement mesophytic decidu-



Fig. 1. Sand wasp collection sites in northcentral New York. + designates Fort Drum Military Reservation and Rome sand plains, ★ localities from previous years.

Table 1. Species of solitary wasps collected and/or observed at the Fort Drum Military Reservation and Rome sand plains.

SPECIES	FORT DRUM	ROME SAND PLAINS	SPECIES	FORT DRUM	ROME SAND PLAINS
TIPHIIDAE			<i>Ammophila pictipennis</i> Walsh	x	x
<i>Tiphia</i> sp.	x		<i>Ammophila procera</i> Dahlbom	x	x
<i>Paratiphia</i> sp.	x		<i>Ammophila urnaria</i> Dahlbom	x	x
<i>Myzinum quinquecinctum</i> (Fabricius)	x		<i>Mimesa basirufa</i> Packard	x	
<i>Methocha stygia</i> (Say)	x	x	<i>Mimesa cressonii</i> Packard	x	
MUTILLIDAE			<i>Diodontus franclemonti</i> (Krombein)	x	x
<i>Timulla vagans</i> (Fabricius)	x		* <i>Pemphredon lethifer</i> (Shuckard)	x	
<i>Pseudomethocha frigida</i> (Smith)	x		* <i>Passaloecus</i> sp.	x	
SCOLIIDAE			* <i>Stigmus americanus</i> Packard	x	
<i>Campsomeris plumipes</i> (Drury)	x	x	<i>Astata leuthstromi</i> Ashmead	x	x
POMPILIDAE			<i>Liris argentata</i> (Beauvois)	x	x
* <i>Priocnessus nebulosus</i> (Dahlbom)	x		<i>Tachytes obductus</i> Fox	x	
* <i>Priocnemis</i> ( <i>Priocnemissus</i> ) <i>minorata</i> Banks	x	x	<i>Tachytes validus</i> Cresson		x
<i>Priocnemis</i> ( <i>Priocnemis</i> ) <i>cornica</i> (Say)	x	x	<i>Tachysphex acutus</i> (Patton)	x	
* <i>Priocnemis</i> ( <i>Priocnemis</i> ) <i>germana</i> (Cresson)	x		<i>Tachysphex similis</i> Rohwer	x	
* <i>Priocnemis</i> ( <i>Priocnemis</i> ) <i>scitula relicta</i> Banks	x		<i>Tachysphex tarsatus</i> (Say)	x	x
<i>Calicurgus hyalinatus</i> (Fabricius)	x		<i>Tachysphex terminalis</i> (Smith)	x	x
* <i>Dipogon papago anomalus</i> Dreisbach	x		<i>Lyroda subita</i> (Say)	x	
* <i>Dipogon sayi</i> Banks	x		<i>Plenoculus davisi</i> Fox	x	x
* <i>Auplopus architectus</i> (Say)	x	x	<i>Miscophus americanus</i> Fox	x	x
* <i>Auplopus mellipes varietatus</i> (Dalla Torre)	x		<i>Oxybelus bipunctatus</i> Olivier	x	x
<i>Evagetes crassicornis</i> (Shuckard)	x		<i>Oxybelus emarginatus</i> Say	x	
<i>Evagetes hyacinthinus</i> (Cresson)	x		<i>Oxybelus subcornutus</i> Cockerell	x	
<i>Evagetes parvus</i> (Cresson)	x	x	<i>Oxybelus subulatus</i> Robertson	x	x
<i>Episyron biguttatus</i> (Fabricius)	x		<i>Anacrabus ocellatus</i> Packard	x	x
<i>Episyron quinque-notatus</i> (Say)	x	x	<i>Lindenius buccadentis</i> Mickel	x	x
* <i>Anoplius</i> ( <i>Lophopompilus</i> ) <i>aethiops</i> (Cresson)	x	x	<i>Lindenius columbianus</i> (Kohl)	x	x
<i>Anoplius</i> ( <i>Lophopompilus</i> ) <i>atrox</i> (Dahlbom)	x		<i>Crossocerus maculiclypeus</i> (Fox)	x	
* <i>Anoplius</i> ( <i>Lophopompilus</i> ) <i>carolina</i> (Banks)	x		<i>Crabro advena</i> Smith	x	x
<i>Anoplius</i> ( <i>Arachnophroctonus</i> ) <i>relativus</i> (Fox)	x	x	<i>Crabro argusinus</i> R. Bohart	x	x
<i>Anoplius</i> ( <i>Arachnophroctonus</i> ) <i>semirufus</i> (Cresson)	x	x	<i>Crabro cribriflifer</i> (Packard)	x	
<i>Anoplius</i> ( <i>Pompilinus</i> ) <i>cylindricus</i> (Cresson)	x	x	<i>Crabro latipes</i> Smith	x	
<i>Anoplius</i> ( <i>Pompilinus</i> ) <i>marginatus</i> (Say)	x	x	<i>Crabro monticola</i> (Packard)	x	x
<i>Anoplius</i> ( <i>Pompilinus</i> ) <i>splendens</i> (Dreisbach)	x	x	<i>Alysson melleus</i> Say	x	x
<i>Anoplius</i> ( <i>Pompilinus</i> ) <i>subcylindricus</i> (Banks)	x		<i>Nysson daeckei</i> Viereck	x	x
<i>Anoplius</i> ( <i>Pompilinus</i> ) <i>tenebrosus</i> (Cresson)	x	x	<i>Ochleroptera bipunctata</i> (Say)	x	x
* <i>Anoplius</i> ( <i>Anoplius</i> ) <i>illinoensis</i> (Robertson)	x		<i>Gorytes canaliculatus</i> Packard	x	x
* <i>Anoplius</i> ( <i>Anoplius</i> ) <i>nigerrimus</i> (Scopoli)	x		<i>Gorytes similis</i> Smith	x	x
* <i>Anoplius</i> ( <i>Anoplius</i> ) <i>ventralis</i> (Banks)	x		<i>Pseudopimplis phaleratus</i> (Say)	x	x
* <i>Anoplius</i> ( <i>Anoplius</i> ) <i>virginiensis</i> (Cresson)	x		<i>Sphecius speciosus</i> (Drury)	x	x
<i>Pompilus</i> ( <i>Arachnospila</i> ) <i>arctus</i> Cresson	x		<i>Bicyrtes quadrifasciata</i> (Say)	x	x
<i>Pompilus</i> ( <i>Arachnospila</i> ) <i>scelestus</i> Cresson	x	x	<i>Bicyrtes ventralis</i> (Say)	x	x
* <i>Pompilus</i> ( <i>Anoplochaeres</i> ) <i>apicatus</i> Provancher	x		<i>Microbembex monodonta</i> (Say)	x	x
<i>Aporinellus completus</i> Banks	x		<i>Bembix americana</i> (Lepeletier)	x	x
* <i>Ceropales maculata fraterna</i> Smith	x		<i>Bembix pallidipicta</i> Smith	x	x
SPHECIDAE			<i>Stictiella emarginata</i> (Cresson)	x	
* <i>Chalybion californicum</i> (Saussure)	x	x	<i>Philanthus albopilosus</i> Cresson	x	
* <i>Sceliphron caementarium</i> (Drury)	x	x	<i>Philanthus bilunatus</i> Cresson		x
<i>Sphex ichneumonaeus</i> (Linnaeus)	x	x	<i>Philanthus gibbosus</i> (Fabricius)	x	
<i>Sphex pensylvanicus</i> Linnaeus	x	x	<i>Philanthus lepidus</i> Cresson		x
* <i>Isodontia mexicana</i> (Saussure)	x		<i>Philanthus politus</i> Say	x	x
<i>Prionyx atratus</i> (Lepeletier)	x		<i>Philanthus solivagus</i> Say	x	x
<i>Podalonia luctuosa</i> (Smith)	x	x	<i>Philanthus ventralis</i> Fabricius	x	
<i>Podalonia robusta</i> (Cresson)	x	x	<i>Aphilanthops frigidus</i> (Smith)	x	x
<i>Eremnophila aureonotata</i> (Cameron)	x	x	<i>Cerceris clypeata</i> Dahlbom	x	x
<i>Ammophila harti</i> (Fernald)	x	x	<i>Cerceris fumipennis</i> Say	x	x
<i>Ammophila nigricans</i> Dahlbom	x		<i>Cerceris nigrescens</i> Smith	x	
			<i>Cerceris robertsonii</i> Fox	x	x

\*Non-sand inhabiting species.

ous and deciduous-coniferous forests on sandy soils in upstate New York (Seischab 1990, 1992; Marks and Gardescu 1992) and the substantial annual amount of evenly distributed precipitation in the region (USDA 1941; Dethier 1966; Garwood 1996) support this contention.

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